Lum. 4.1-88
August 16, 2005

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Hashem Akhavan-Tafti, Renuka de Silva, Robert A. Eickholt, C. William Gundlach, Richard S. Handley, Kenneth S. Lauwers, Mark D. Sandison and Wenhua Xie

Serial No.: 10/715,284 Group Art Unit: 1637

Filed: November 17, 2003

For: CLEAVABLE SOLID PHASES FOR ISOLATING NUCLEIC ACIDS

Examiner: TBA

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT UNDER 37 CFR 1.97(b)(3) and 1.98

Sir:

The information statement is being submitted before the issuance of a first Office Action. Provided herewith are a listing of references in the attached form PTO-SB/08 and copies of 5 non-U.S. Patent references. Applicants submit the references in the present case pursuant to their obligation under 37 CFR §§ 1.56, 1.97(b)(3) and 1.98. A concise statement of their relevance is either described in the specification of the subject application or is as follows.

References A-EE and UU-YY are described in the specification.

Reference FF (U.S. Patent 4,935,342) describes a method of purifying cellular or viral nucleic acids from a biological sample

purifying cellular or viral nucleic acids from a biological sample by binding nucleic acids to an anion exchange column material at a lower salt molarity than the molarity at which the target nucleic acids elute therefrom, washing said column with an aqueous salt solution of a second chloride molarity, and eluting the bound nucleic acids with a salt solution having a higher chloride molarity.

Reference GG (U.S. Patent 4,997,932) also describes a method of purifying nucleic acids from a biological sample by binding nucleic acids to an anion exchange column material and eluting sequentially with a low salt molarity solution and then with an high salt molarity solution.

Reference HH (U.S. Patent 5,057,426) describes a method for separating long-chain nucleic acids from other substances by fixing long-chain nucleic acids onto a porous anion exchanger matrix having a particle size of from about 15 to about 250 μm and a pore diameter of about 100 to 2500 nm, washing the porous matrix to separate the other substances from the long-chain nucleic acids, and removing the fixed long-chain nucleic acids from the porous matrix.

Reference II (U.S. Patent 5,075,430) describes a process for purifying DNA from a liquid mixture by combining the liquid mixture with a chaotropic agent and contacting the resulting combination mixture with silica in the form of diatomaceous earth to selectively adsorb DNA, washing the silica with a buffer

containing from about 20% to about 95% of a lower alkyl alcohol to remove non-adsorbed matter, and eluting said DNA from said silica with water or a low salt buffer.

Reference JJ (U.S. Patent 5,155,018) describes a process for isolating biologically active RNA from a biological source by contacting said the source with particulate siliceous material in the presence of an acidified, concentrated chaotropic salt solution, to bind RNA to said particles, removing said particle-bound RNA from said source, and separating said biologically active RNA from said particles.

Reference KK (U.S. Patent 5,234,809) describes a process for isolating nucleic acid from a starting material by mixing the starting material, a chaotropic substance and a nucleic acid binding solid phase, separating the solid phase with the nucleic acid bound thereto from the liquid, and washing the solid phase nucleic acid complexes.

Reference LL (U.S. Patent 5,599,667) describes a method for purifying a polynucleotide greater than 100 nucleotides in a sample from shorter oligonucleotides 10 to 100 nucleotides long by contacting the sample with a solid support comprising a plurality of cations selected from ammonium, immonium and guanidinium ions, to bind the polynucleotide but not the shorter oligonucleotides, wherein the polynucleotide is at least three times longer than the shorter oligonucleotides, and separating the oligonucleotides from the support-bound polynucleotide.

Reference MM (U.S. 5,665,582) claims a method for reversibly

anchoring a biological material to a solid support having a reversible polymer placed thereon, attaching a reversible linker to the polymer, linking the biological material to the linker with a binding composition, and then subsequently releasing the biological material. The binding composition is defined as a separate substance, i.e. a complementary nucleic acid, an antibody or a binding protein, which is dispersed in or coated on the reversible polymer.

Reference NN (U.S. Patent 5,948,624) describes a method for isolating targets, including nucleic acids, from a mixture by reacting targets with a conjugate having a detector portion linked by a photocleavable portion to a coupling portion. Targets are chemically coupled to the conjugate, separated, and then photochemically cleaved. The methods differ from the present invention in requiring covalent attachment of target nucleic acids to small molecule cleavable conjugates.

Reference OO (U.S. Patent 6,027,945) describes a method for isolating a biological target material from other material in a medium by combining silica magnetic particles and the medium, binding the target material to the particles, removing the complex from the medium with an external magnetic field, and separating the biological target material from the complex by eluting the biological target material.

Reference PP (U.S. Patent 6,060,246) discloses a method for isolating or detecting in a sample a polynucleotide analyte having a target base sequence by using a rapid pairing reagent comprising

a solid substrate linked to a capture component and a target-specific probe. The capture component non-selectively binds to polynucleotide molecules, while the target-specific probe selectively binds the target base sequence of the polynucleotide analyte.The rapid pairing reagent-polynucleotide analyte complex is exposed to conditions which release the polynucleotide molecules from the capture component without disrupting said substrate-probe-target complex. The capture component can be an amine having a pKa of about 4-8 which binds polynucleotides at a pH below its pKa and releases them at a pH substantially above its pKa. The capture component can be linked to the substrate via a cleavable linkage.

Reference QQ (U.S. Patent 6,270,970) describes a mixed-bed solid phase and uses for isolating a target nucleic acid from a mixture. The solid phase comprises a first ion-exchanger solid phase which can bind to the target nucleic acid at a first pH, and release target nucleic acid at a second pH differing by at least 0.5 pH units; and a second ion-exchanger solid phase which can bind to the target nucleic acid at the second pH and release at the first pH; and both the first and second ion-exchangers having a capacity to release the bound target nucleic acid in the presence of an elution buffer.

Reference RR (U.S. Patent 6,447,764) describes a method for isolating anionic organic substances such as nucleic acids from aqueous systems by reversibly binding the organic substances to non-crosslinked polymer nanoparticles in cationic, protonated

form, forming charged polymer nanoparticles, separating the charged polymer nanoparticles from the aqueous system, and releasing the organic substance from the nanoparticles by raising the pH to deprotonate the positively charged groups.

Reference SS (U.S. Patent 6,780,327) describes a positively charged porous membrane for separating negatively charged molecules from a solution. The positive charge can be supplied by a pendant quaternary ammonium group. No cleavable linkers are disclosed.

Reference TT (U.S. Patent 6,914,137) describes a solid phase for reversibly binding nucleic acids in a sample, the product comprising a plurality of immobilized positively ionizable groups which bind nucleic acid at a first pH at which the ionizable groups are positively charged and release the nucleic acid at a second, higher, pH at which the charge on the ionizable groups is negative, neutral or less positive.

Reference WW (Eur. Patent EP01036082) describes a method of extracting a nucleic acid from a sample using the materials as described in related U.S. Patent 6,914,137.

Respectfully submitted,

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 1 of 4

Complete if Known	
Application Number	10/75,284
Filing Date	November 17, 2003
First Named Inventor	Hashem Akhavan-Tafti
Art Unit	
Examiner Name	
Attorney Docket Number	Lumigen 4.1-88

U. S. PATENT DOCUMENTS

Examiner Initials*	Cite No.[1]	Document Number Number-Kind Code[2] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
	A	US- 4699717	10-13-1987	Riesner	
	B	US- 5057426	10-15-1991	Henco	
	C	US- 4395271	07-26-1983	Beall	
	D	US- 4233169	11-11-1980	Beall	
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	M	US- 4628037	12-09-1986	Chagnon	
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	R	US- 5411730	05-02-1995	Kirpotin	
	S	US- 5707559	01-13-1987	Schaap	

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Examiner Initials*	Cite No.[1]	Foreign Patent Document Country Code[3]-Number[4]-Kind Code[5] *(if known)*	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear	T[6]
	T	EP 0496822 B1	10-17-1990	Macherey		
	U	EP 1243649 A1	03-23-2001	Muller		
	V	EP 01036082	05-29-2002	Baker		
	W	03/053934 PCT Publication	07-03-2003	Akhavan-Tafti		

Examiner Signature		Date Considered	

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	QQ	US- 5665582	09-09-1997	Kausch	
	RR	US- 5948624	09-07-1999	Rothschild	
	SS	US- 6027945	02-22-2000	Smith	
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NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.[1]	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T[2]
	YY	Advanced Chem Tech 2003, catalog, pp. 105-150	

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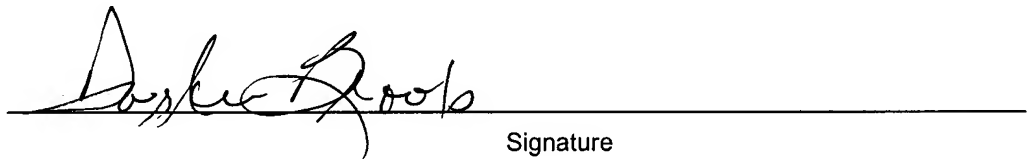

Signature

Darlene Brooks
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248-351-5600
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